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One was of a lady who suffered from violent puerperal convulsions, followed by fever, which rendered her practically unconscious for ten days. After her recovery she found that she had lost entirely the recollection of every thing that happened during the week before her sickness.

In another case two gentlemen of my acquaintance, while driving across a railroad, were struck by the engine. One of them was instantly killed: the other was so seriously injured that he was unconscious for twenty-four hours, and for several weeks lay at the point of death; after his recovery he never regained the recollection of going to drive on that fatal morning.

In another instance a gentleman well known to me was thrown from his carriage by a runaway horse and by collision with another team. He was rendered insensible for fifteen or twenty minutes, and after regaining consciousness, although he remembered his horse running away with him, he never had any recollection of the collision or of falling.

In each of these cases there seems to have been some relation between the length of the period of unconsciousness after the sickness or accident, and the memory-blank before it.

JOSEPH HALL.

Hartford, Conn., Nov. 12.

Changes in Indian Languages.

THAT unwritten languages might change more rapidly than those which are preserved in books is very evident, though the verses of Chaucer and Spenser would puzzle the modern school-boy. Yet the vocabulary of an unlettered people has elements of stability in its comparatively few words, and often in the songs and ceremonies preserved through many generations. How rapidly they may change is not so easily proved, for this requires accurate vocabularies made long ago, which must be carefully compared with a language at a recent period. A moderate basis may be found for such a comparison in the case of some of the New York Iroquois, who early attracted the attention of learned men, and from this may be drawn a few suggestions.

I make this comparison now, in the case of the Mohawks, between Father Bruyas' lexicon, written about A.D. 1700; the 'Mohawk Prayer-Book' of 1769; and Schoolcraft's 'Notes on the Iroquois,' written in 1845. The later prayer-book of Rev. Eleazar Williams might also be cited, as the work of an educated man brought up as a Mohawk; but its marked differences from all other books printed in that language would require a good deal of comment. Father Bruyas' lexicon is of radical words, and deals with phrases and verbs much more than with nouns and adjectives; yet I make the comparison on the latter. In a little over one hundred words common to both Schoolcraft and the missionary, fifty-one differ almost entirely, while fifty-eight are either alike, or so nearly so as to have the resemblance apparent. Perhaps half of the latter number are modified forms of the same words. These represent the changes of an existing Indian language in about a century and a half, so far as they may be called changes. About one fourth are the same as they were in A.D. 1700; another fourth are partially changed; nearly one-half differ entirely.

It is to be remembered in this, that, in a language whose words are often descriptive, several words might represent the same object, and often do so, while a writer may choose but one of these. Many synonymes appear in Bruyas' vocabulary and in the 'Mohawk Prayer-Book.' One of these words, once common, might disappear and be succeeded by another, not new, but for a time obscure. In Schoolcraft's vocabulary each English word has a single Mohawk word as its equivalent. There may have been many others which do not appear.

The 'Mohawk Prayer-Book' of 1769 was the work of several hands, and has comparatively few of the words found elsewhere. I have not made a close comparison, but have noted twenty-five names agreeing with Bruyas, and thirty with Schoolcraft, while it has very many given by neither. It is hard to catch or represent the Iroquois inflection, and so spelling has made a difference where the word is clearly the same, though possibly changed. Thus 'ice' was rendered *Gawisa* in 1700, *Owiese* in 1769, and *Orse* in 1845, the latter perhaps approaching our own word. Some words which

I have classed as similar are much farther apart than these, often differing greatly.

As this paper is only suggestive, I note some changes in the Onondaga language, based on a comparison of Zeisberger's dictionary, made subsequent to 1750, and Schoolcraft's vocabulary of 1845. In comparing nouns and adjectives common to both, out of one hundred and fifty, I find eighty-six entirely or widely different, and sixty-four the same or plainly similar. In regard to the nature of these changes, the same remarks apply as to the Mohawk. Relatively the latter might be called a written language, and had changed much less in a century and a half than the Onondaga had in less than a century. In a sense the latter might seem almost a new language. Many words in it, of course, are new, as those of animals and articles of which their fathers knew nothing, and doubtless others were assumed for familiar things when some one hit on a new characteristic. The word for 'hog' is expressive of its voice, and is better rendered by Zeisberger as *Kweas kweas* than by the modern *Quis quis*. *Git git* does very well for a hen, and others as good might be cited. The Oneidas and Onondagas formed different names for the elephant, yet easily understood by both; the one calling it 'that great naked animal,' and the other terming it the 'long nose.' The Onondaga name for the black raspberry is descriptive, 'the plant that bends over,' and many are quite as picturesque. This shows how a vivid imagination could readily multiply or change names among a primitive people, and how verbs might persist long after nouns had vanished. Place such a people by themselves, amid new scenes, and how quickly their speech might alter! The Onondagas have not moved over twenty miles in two hundred and fifty years, yet how much their tongue has changed in less than half that time! A migration to new and distant homes would have produced many new words, and then the language would have remained much the same for a time, waiting for other disturbing causes.

W. M. BEAUCHAMP, D.D.

Baldwinsville, N.Y., Nov. 11.

Distillery-Milk.

AFTER the grain is mashed (corn comprises three-quarters of the grain used), it is cooled and run into the fermenting-tubs, where the yeast is added. The period of fermentation is seventy-two hours the first three days in the week, and ninety-six hours the last four days, which include Sunday; this length of time being considered by the government sufficient to ferment all of the saccharine. It is during this period that the acetic acid is formed, unless very great care is taken. It does not necessarily follow that acetic acid appears but acetic fermentation occurs more often than otherwise.

At the expiration of the fermenting period, the 'beer' (the entire mass in fermentation) is run through the 'still' at a temperature supposed to evaporate all the alcohol and fusel-oil; which vapor is run into a worm from the top of the still, and the 'slops' run from the bottom of it. The mash or beer can be distilled so as to leave little if any alcohol or fusel-oil in the slops, or feed; but in general practice there is a trace of alcohol and fusel-oil left in the feed.

I have tested slops coming from a still when the instrument varied from 0 to 3 per cent alcohol. No test was made for fusel-oil. So large a per cent of alcohol as 3 per cent is unusual, and it would be found very unprofitable to the distiller. The slops are fed to the cows while hot. Each cow's ration is thirty-six gallons a day. If the water was evaporated from that quantity of slops, it would leave about twelve pounds of grain; or, in other words, there is 2,400 per cent more water than grain in the slops.

With the entire system in practice to-day, the food is not desirable for milch-cows, but it might be made so. But the sanitary conditions at Blissville and Chicago were a thousand times more harmful to the cows, and necessarily to the milk also, than the food upon which they were fed. I speak from observation of cows under good and bad sanitary conditions and care, fed on distillery slops.

The Germans would be horrified to see any kind of animals surrounded by the conditions at the places named. Europeans excel Americans in the sanitary condition and care of their stables and stock, etc.

Our general system is not only wasteful, and based on false economy, but the quality of milk is not up to a proper standard. As a matter of fact, the milk supplied to New York City is inferior (much of it is unwholesome, and unfit for use) to that of any city in Europe.

The question of still-fed milk is of little moment as compared to milk from so much greater quantity of other and more injurious feed, now in general use, and as compared to the sanitary conditions and treatment of the cows, stables, and milk, and the water the cows consume, — one of the most important elements in dairying. There is not one well in a hundred that furnishes pure water.

Brewers' and glucose grains are shipped into the country by the millions of bushels annually. Brewers' grains are good feed for milch-cows if fed the day they are produced. Glucose grains, with the sulphuric-acid treatment necessary in the factory, are injurious to both cow and milk. These grains are sent into the country wet and hot, fermenting, souring, and spoiling as they go. So the farmers' cows, with every shipment, have feed in a state of fermentation, often rotten, and fit only for the dung-hill. Distillers' slops, as fed, have undergone fermentation, while the grains are fed while fermenting, — a strong point in favor of slops.

B. M. W.

New York, Nov. 2.

Microscopic Sections of Corals.

IN *Science*, No. 248, Mr. A. F. Foerste takes exceptions to a note of mine in No. 244, and contends that the internal features of Lower Silurian monticuliporoids are not only of value in classification, but that they are the ones most worthy of study, and of almost sole use. I ask space for a brief reply.

I have, in the first part of a paper on monticuliporoids, given quotations and references showing that even by the new method of work in the corals it is not always possible to separate either species or genera. To state that this method gives 'solidity' to classification, and allows "the species to fall into easily recognized groups," is, I believe, a mistake. Dr. Nicholson, for example, in speaking of two genera, says (*Tabulate Corals*, p. 99), "There is, indeed, no feature in the way of internal construction which could be brought forward as separating *Striatopora* from *Pachypora*; and in distinguishing these two types we have to fall back upon a well-marked external character." The distinctions between *Dekayia* and *Monticulipora* are external, and not internal. Between species there is even less difference. One of Mr. Ulrich's species, for instance, is almost the exact counterpart of another: so here, again, the separation is made on external features.

My examination and study of the descriptions of the genera made by Mr. Ulrich has led me to discard all of them. The features upon which they are based are so few, so trivial, and so inconstant, that it becomes an utter impossibility to separate them with any certainty. I have not had the opportunity of seeing Mr. Ulrich's latest ideas in regard to the subject upon which he has written so much, so that I cannot tell how he may have modified or changed his conclusions. It is my belief, however, that it is impossible for one who studies the descriptions of genera and species as given by Mr. Ulrich to state positively, after he has examined a specimen macroscopically and microscopically, that he has a desired genus or species in hand.

Mr. Foerste lays stress upon the form of the cells as seen in tangential section. The same features are to be seen on the exterior, and are free from errors likely to result from sections made at a slightly different angle from the one intended. "Elevated patches of cells" cannot be recognized in internal sections in *very* many cases, as Mr. Foerste states is the case; for these are often of the same size and shape as surrounding cells. It were useless to deny the difficulty of finding specimens suitable for description. In many cases it were best had they not been described at all.

Finally, in relation to the difficulty of studying microscopic characters, I have but this to say: that it is not the difficulty itself or alone, but the unreliability of the work. I would be the last one to discard a method of work simply because it was difficult. But when it becomes difficult (and there can be no denying this, in spite of the assertion to the contrary), tedious, and uncertain, and when finally we are compelled to fall back upon external features because the internal ones fail, I contend that their use for ordinary

practical work in the field or in the study is of little or no value. I can quote no higher authority than Mr. Archibald Geikie (*Text-Book of Geology*, pp. 85-88, where elaborate directions are given for making rock sections; Professor Prestwich also considers it "an expensive and tedious process," *Geology*, i. p. 43) as to the tediousness of the process, nor a better one than Dr. Nicholson as to the uncertainty of the results (*Palaeozoic Tabulate Corals*, and *The Genus Monticulipora*). In conclusion, I can only refer to the paper on the subject by Mr. U. P. James and myself, for the full expression of my views, and I shall be happy to furnish a copy of the paper to any of those desirous of seeing these views in full for their own satisfaction.

JOSEPH F. JAMES.

Miami University, Oxford, O., Nov. 7.

Indian Names.

THE publication of the 'Early Map of the Far West,' in your last issue (*Science*, x. No. 248) gives occasion to draw attention to the changes in pronunciation which have been brought about by pedagogic conceit. 'Arkansaw' or 'Arcansaw,' of Lewis's map, gives the old pronunciation. 'Chipaway' of Lewis's map gives the true pronunciation of 'Chippewa.' 'Ojibwa' is the same word, and is pronounced 'Ojibway.' The pronunciation of 'Kansas' has not changed. It is given as 'Kansas' in Lewis's map, and 'Canzes' in the map of Louisiana by De L'Isle, eighteenth century. 'Iowa' has suffered much from the pedagogues. The polite pronunciation now is 'I-o-wah,' with the accent on the first or second syllable. The old pronunciation was 'I-o-way,' accent on the last syllable. In Lewis's map the word is found as 'Ayauwais;' in De L'Isle's map, as 'Aiaouez' or 'Yoways.' 'Euisconsin' (Wisconsin) has fortunately remained unchanged; so has 'Pani,' which we now spell 'Pawnee.'

I once met an Indian who called himself a 'Taw-wah,' accent on first syllable. Unable to recall a tribe of such name, I had him repeat the word several times, and at length discovered an almost silent vowel before the *T*. It is Ottawa. I am not sure, however, whether this man pronounced his tribal name correctly, for he had long lived among the whites, and had gone to school. I find that tribe's name in Jeffery's map of Louisiana and Canada, 1762, given as 'Outawais,' where the final syllable is 'way.'

JOSEPH D. WILSON.

Chicago, Nov. 8.

The Temperature Sense.

IT may be interesting to those who have been acquainted with the experiments of Goldscheider, and of Dr. Donaldson and Prof. G. Stanley Hall in Johns Hopkins University, to prove the existence of a separate system of nerves for temperature, to know that the discovery was anticipated by Sir. William Hamilton. His observations of psychological phenomena seem to have been nearly as extensive as his philosophic reading. In his edition of Thomas Reid's works (vol. ii. p. 875), after commenting on a singular and exceptional case of paralysis, in which sensations of touch did not seem to be localized, he takes the occasion to hazard the conjecture, based upon observations of his own, that there is a distinct set of nerves for sensation of temperature. His language is, —

"I may notice also another problem, the solution of which ought to engage the attention of those who have the means of observation in their power. Is the sensation of heat dependent upon a peculiar set of nerves? This to me seems probable, (1) because certain sentient parts of the body are insensible to this feeling, and (2) because I have met with cases recorded, in which, while sensibility in general was abolished, the sensibility to heat remained apparently undiminished."

J. H. HYSLOP.

Baltimore, Md., Nov. 10.

Answers.

16. PENNSYLVANIA POT-HOLES. — Described in Report Z, Geological Survey of Pennsylvania, p. 111, footnote, by Professor Lesley; also in the *Scranton Republican* of Nov. 4, 1887.

JOHN C. BRANNER.

Little Rock, Ark., Nov. 7.